DIGITAL CONTROL LOOP TO SOLVE INSTABILITY OF ELECTROSTATIC DRIVES BEYOND 1/3 GAP LIMIT

Abstract of Disclosure

A circuit (40) and method are provided to create a drive voltage that is linearly proportional to a position of a movable member (12) of an electrostatic actuator device (10) that is positioned by a voltage (18) applied thereto. The circuit (40) has a sensor (42) to sense a position of the movable member (12) from a reference position (d_0) to provide an analog position indicating signal. An analog-to-digital converter (ADC) (46) receives the analog position indicating signal and converts it to a digital position indicating signal. A digital signal processor (DSP) (48), programmed to convert the digital position indicating signal into a digital signal that is linearly proportional to the position of the movable member, receives the digital position indicating signal. A digital-to-analog converter (DAC) (50) receives the digital signal that is linearly proportional to the position of the movable member for producing a linear analog positioning command, and a voltage amplifier (52) receives the linear analog positioning command to produce a position voltage and for application to the movable member (12).